Prism Palace

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

We call a multiset of real numbers S cool, if and only if there exists x in S, so that $\sum_{y \in S} y = 2x$.

Little D wants to build a prism palace using two parallel planes $A(z = 0), B(z = 10^9)$ that she has. To finish her build, she borrows a polygon P consisting of n points from Little N. She puts two identical Ps on the two planes, one on each, but when deciding the positions of the two polygons, rotating is not allowed. In other words, the two polygons must be identical to P, and must be able to coincide by translating without rotating.

Together, the two polygons form a prism-shaped palace between them. Let the projection area of the prism's sides perpendicularly onto plane A be $S_1, S_2, \cdots S_n$, you need to find the probability of the multiset $\{S_i\}$ being cool.

It is guaranteed that the polygon is convex, i.e. every inner angle of the polygon is smaller than π.

Input

The first line of input contains a single integer $n (3 \le n \le 2 \times 10^5)$, denoting the number of vertices of polygon P.

The next n lines each contain two integers (x_i, y_i), denoting the vertices of polygon P. It is guaranteed that $|x_i|, |y_i| \le 10^9$.

The polygon P is formed by connecting (x_i, y_i) and $(x_{i \bmod n+1}, y_{i \bmod n+1})$ where $1 \le i \le n$.

Output

The output contains only one real number, denoting your answer.

Let your output be u, and the answer be p, you'll get accepted if and only if $\frac{|u-p|}{\max(1,p)} \le 10^{-6}$.

Examples

standard input	standard output
3 0 0 1 0 0 1	1.000000000000000
4 0 0 0 1 1 1 1 0	0.000000000000000
4 0 0 0 3 1 2 1 1	0.500000000000000

Note

For testcase one, you can see that whatever the two polygons' positions are, the largest of the three projection areas is always the sum of the other two, so the answer is 100%, or 1.0.